

NASA Briefs

NASA selects Mars meteorite researchers

NASA has selected 16 proposals to study samples of the Martian meteorite as part of a coordinated program with the National Science Foundation that grew from the announcement last August that a JSC-led research team had found evidence of ancient Martian life in a sample of the meteorite. The NASA grants were awarded under the Ancient Martian Meteorite Research program, a coordinated research program to investigate this and related meteorites in greater depth. The awards total about \$1 million for the first year and about \$500,000 the second year.

NASA, NASDA set rainfall satellite date

NASA and the National Space Development Agency of Japan have set 2:40 p.m. CST Oct. 31 as the official launch date for the Tropical Rainfall Measuring Mission. The first Earth science satellite dedicated to studying the properties of tropical and subtropical rainfall, the satellite will carry microwave and visible/infrared sensors, and the first spaceborne rain radar.

Exploration pioneer Rahe dies in storm

Dr. Jurgen H. Rahe, 57, science program director for exploration of the solar system at NASA Headquarters, died tragically June 18 in the Washington, D.C., area. Rahe was killed during a storm when a large tree fell on his car as he was driving near his home in Potomac, Md. He had a distinguished career in the field of astronomy and space exploration. He was responsible for overall general management, budget, and strategic planning for NASA's Solar System Exploration programs, including the Galileo mission to Jupiter and upcoming missions to Mars, including the July 4, 1997, landing of Mars Pathfinder.

Scientists control robot remotely

From laboratories and a science center in North America, a group of NASA and Carnegie Mellon University scientists are controlling a robotic rover this summer as it explores a desert in South America to learn more about driving automated vehicles on Mars and the Moon. During the "Nomad" field experiment from June 15 to July 31, scientists from NASA's Ames Research Center and Carnegie Mellon's Robotics Institute, Pittsburgh, Pa., are conducting an unprecedented 120-mile robotic trek in the Atacama Desert in northern Chile.

Einstein was right—black holes do spin

A NASA scientist has made the first-ever observation of spinning black holes—confirming Einstein's theory that they spin. The new observations from several orbiting spacecraft adds to the growing body of knowledge on how these mysterious objects are formed and behave. Black holes—predicted by Einstein's General Theory of Relativity—are believed to result from the collapse of a star or a group of stars. A black hole is an extremely compact and massive object with such a powerful gravitational field that nothing—not even light—can escape. In a paper published by The Astrophysical Journal, Letters, Dr.

Shuang Nan Zhang of the Universities Space Research Association at NASA's Marshall Space Flight Center and his research associates report that two of the black holes they have studied are rapidly spinning—rotating 100,000 times per second—while others are spinning very slowly or not at all. By comparison, before this discovery, the Crab Pulsar was considered to be among the most rapidly spinning objects in the universe; rotating 33 times per second. "Black holes have always been difficult objects to define. We can only characterize them with three properties—mass, charge and spin,"

Zhang said. "In the past, we've only been able to measure a black hole's mass. But now that we've learned how to measure a second property — spin rate — one might say that we are two-thirds of the way to understanding black holes. This is a major leap in unraveling the black hole mystery," Zhang said. "Determining the spin of black holes is of enormous importance, not only that the spin gives us an idea of how much angular momentum the black hole has 'swallowed' during its lifetime, but also we can examine whether the spin is related to the formation of powerful jets," said Dr. Mario Livio, senior scientific

staff member at the Space Telescope Science Institute. "The two rapidly spinning black holes also occasionally eject streams of high-speed material called relativistic jets from the black hole region—at roughly the same speed at which the hole is spinning," Zhang said. Since a black hole emits no light, the best way to observe it and learn about its properties is to study its interaction with the environment around it. "The Theory of Relativity explains that there should be a last stable orbit around the black hole," Zhang said. "Material inside this orbit cannot survive and is consumed by the black hole."



Photos by Ginger Gibson

MOODY OPENING—Visitors to Moody Garden's Discovery Pyramid Grand Opening on May 31 were treated to a variety of exhibits by JSC employees, illustrating the work done at the center. Visitors also had an opportunity to meet the latest class of Astronaut Candidates. 1) Astronaut Candidate Don Pettit signs autographs at the Mars exploration exhibit. Looking on from left to right are: Chris Jones, Everett Gibson, Michelle Wonk and Lindsay Edwards; 2) Canadian Astronaut Candidate Julie Payette signs autographs at the robotics technology exhibit; and 3) four members of the extravehicular activity project team provide a demonstration of the use of the extravehicular mobility unit space suit. Pictured from left to right are: Joey Marmolejo, Joe Settles, Keaton Chhipwadia and Jason Poffenberger.

First piece of U.S.-built station hardware flies to Cape

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Node 1 is now in Kennedy's Space Station Processing Facility, a new facility completed in 1994 and designed specifically for preparing space station elements for launch. "The arrival of our first launch element—the Node—here at KSC has been a long time in coming and clearly is a major milestone for the program as we transition from the development phase into the operational phase," Brinkley said. "Seeing hardware here at the Cape brings a new dimension to the program. It

took tremendous effort by a lot of people, particularly the last six months, to be able to meet this milestone on time." Assembly Flight 2A Launch Package Manager Bill Bastedo commended the work of the assembly and checkout teams. "In the six months it was executed, they installed over 50,000 mechanical items," Bastedo said. "About 216 lines were installed into the different systems to carry fluids and gasses; over six miles of wire was used to put this together. It was

performed by a team of about 200 people that were very dedicated." The node will be joined by two pressurized mating adapters, the first arriving at Kennedy in July from the McDonnell Douglas manufacturing facility in Huntington Beach, Calif. Prior to launch, the two conical mating adapters will be attached to either end of the node at Kennedy. In orbit, the two adapters will serve as the connecting point for the U.S. and Russian station segments and as a docking location for the shuttle. "The Kennedy team at the Space

Station Processing Facility has been preparing for several years for this occasion," said Glenn Snyder, Kennedy payload manager for STS-88. "We are looking forward to getting started with the processing of the first element as well as the others that will follow." Work on Node 1 at Kennedy will include the completion of assembly and checkout tasks; acceptance testing of the node and mating adapters; communications testing with Mission Control; leak testing; and toxicology testing.

STS-94 mirrors future International Space Station work

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and Payload Specialists Roger Crouch and Greg Linteris will spend more than two weeks in orbit aboard *Columbia* as they continue NASA's efforts to understand the subtle and complex phenomena associated with the influence of gravity in many aspects of daily life. They will conduct a variety of experiments to examine how various materials and liquids change and behave in the weightless environment of space. The countdown for launch began on time at 2 p.m. CDT Saturday, June 28. The same day, the crew flew from Ellington Field to the Shuttle Landing Facility at KSC. *Columbia* was targeted for launch from Launch Complex 39-A at 12:50 p.m. CDT. With an on-time launch on July 1 and a nominal 16-

day mission, *Columbia* should land at KSC on July 17 about 5:26 a.m. CDT. STS-94 will continue the tests begun during STS-83 of hardware, facilities and procedures that will be used on the International Space Station. MSL-1 will again serve as a test-bed for new ways to conduct experiments in space — helping to validate and improve that process. STS-94 also mirrors the future work aboard the station with international complexion of the flight. The MSL-1 mission brings together academic, industrial and governmental partners from around the world. Scientists from four space agencies developed 33 investigations, and representatives of the European Space Agency, the German Space Agency and the National Space Development

Agency of Japan will participate. While the STS-94 crew is busy in Earth orbit, processing on the other space shuttles continues. *Discovery*, scheduled to conduct STS-85, is scheduled to roll from the Orbiter Processing Facility to the Vehicle Assembly Bldg. on July 7. After the orbiter is attached to the external tank, the entire launch stack will be moved out to Launch Pad 39A. The current target launch date for STS-85 is Aug. 7. However shuttle managers are considering trying to advance the launch date by a couple of days to avoid range conflicts. STS-85 will involve deployment and retrieval of the CRISTA-SPAS payload using the shuttle's mechanical arm. The Manipulator Flight Demonstration, an attached payload, will demonstrate the oper-

ational capability of the Japanese Experiment Module remote Manipulator System's Small Fine Arm. *Discovery's* cargo bay will also contain the Technology Applications and Science payload, seven separate experiments mounted on a crossbay Hitchhiker structure. *Atlantis* is being readied for the seventh docking mission to the Mir space station. STS-86, targeted for launch around Sept. 18, is the next planned exchange of U.S. astronauts. Mike Foale, who has been aboard Mir since mid-May will come home aboard *Atlantis*. If things go as planned, he will be replaced by astronaut Wendy Lawrence, who will live and work aboard the orbiting Russian facility until *Endeavour* docks with the station in January 1998.

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ROUNDUP

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